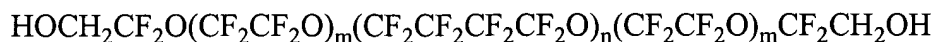
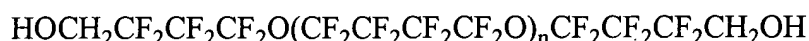
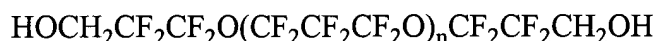
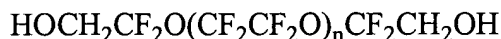
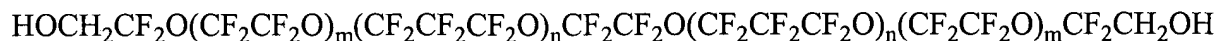


1. A photosensitive composition comprising:
- at least one fluorinated (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule;
  - at least one non-fluorinated (meth)acrylate, said at least one non-fluorinated (meth)acrylate being soluble in said fluorinated (meth)acrylate, said non-fluorinated (meth)acrylate having at least two (meth)acrylate groups per molecule; and
  - at least one photoinitiator, said photoinitiator being soluble in the fluorinated (meth)acrylate.

2. The composition of Claim 1, wherein the fluorinated (meth)acrylate is prepared from a fluoropolyether diol selected from the group consisting of

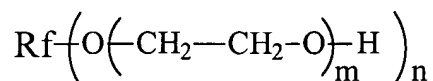


and



wherein m and n are integers ranging from 1 to 50.

1           3. The composition of Claim 1, wherein said at least one fluorinated (meth)acrylate is  
2 prepared from an ethoxylated fluoropolymer having the following formula:



3  
4 wherein Rf is a fluorinated moiety having a F/H ratio of at least 3:1, m = 1-10, and n = 2-6.

1           4. The composition of Claim 1, wherein said at least one fluorinated (meth)acrylate has a  
2 number average molecular weight of at least 400.

1           5. The composition of Claim 1, wherein said at least one non-fluorinated (meth)acrylate  
2 has at least 3 (meth)acrylate groups per molecule.

1           6. The composition of Claim 1 wherein the fluorinated (meth)acrylate is prepared from a  
2 fluorinated hydroxy-containing monomer or polymer and (meth)acryloyl chloride using a hindered  
3 tertiary amine, said amine having at least one tertiary or quaternary carbon atom.

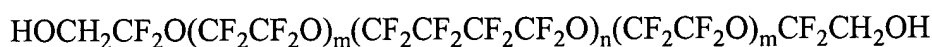
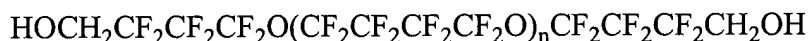
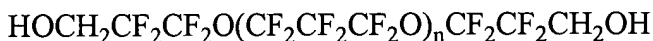
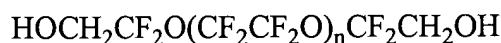
1           7. The composition of Claim 5 wherein the hindered tertiary amine is N,N-  
2 diisopropylethylamine.

1           8. The composition of Claim 1 further comprising additives selected from the group  
2 consisting of contrast enhancers, UV stabilizers, antioxidants, surfactants, adhesion promoters, and  
3 viscosity thickeners.

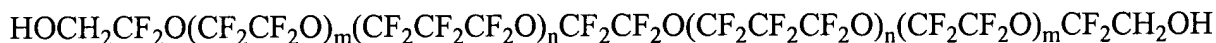
1           9. A polymer coating formed by exposing the composition of Claim 1 to an actinic  
2 radiation.

10. A waveguide device having a light-transmitting structure formed on a substrate by patterning a photosensitive composition comprising at least one fluorinated (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule; at least one non-fluorinated (meth)acrylate, said at least one non-fluorinated (meth)acrylate being soluble in said fluorinated (meth)acrylate, said non-fluorinated (meth)acrylate having at least two (meth)acrylate groups per molecule; and at least one photoinitiator, said photoinitiator being soluble in the fluorinated (meth)acrylate.

11. The waveguide device of Claim 10, wherein the fluorinated (meth)acrylate is prepared from a fluoropolyether diol selected from the group consisting of

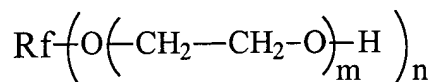


and



wherein m and n are integers ranging from 1 to 50..

12. The waveguide device of Claim 10, wherein the at least one fluorinated (meth)acrylate of the photosensitive composition is prepared from an ethoxylated fluoropolymer having the following formula:



wherein Rf is a fluorinated moiety with F/H ratio of at least 3:1,  $m = 1-10$ , and  $n = 2-6$ .

13. The waveguide device of Claim 10, wherein the at least one fluorinated (meth)acrylate of the photosensitive composition has a number average molecular weight of at least 400.

14. The waveguide device of Claim 10, wherein the at least one non-fluorinated (meth)acrylate of the photosensitive composition has at least 3 (meth)acrylate groups per molecule.

15. The waveguide device of Claim 10, wherein the waveguide structure is patterned with actinic radiation.

16. The waveguide device of Claim 10, wherein the waveguide structure is patterned with reactive ion etching (RIE).

17. A thermo-optic device comprising a waveguide structure of Claim 10 and at least one resistive heater.

18. The waveguide device of Claim 10 wherein said structure containing at least one optical grating element.

19. The waveguide device of Claim 18 wherein said device comprising at least one resistive heater.

20. A method for preparing a waveguide device, the method comprising:

a) forming a first layer of solid composition on a substrate, said first layer having a refractive index,  $n_1$ ;

b) coating a second layer of a second composition, having at least one (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule, at least one non-fluorinated (meth)acrylate which is soluble in said fluorinated (meth)acrylate and has at least two (meth)acrylate groups per molecule, and at least one photoinitiator soluble in the fluorinated (meth)acrylate on a substrate;

c) patternwise exposing the coating of the second composition to an actinic radiation through a photomask having a desired feature to form a latent image in a core layer;

d) removing the non-exposed parts with an organic solvent to form a waveguide rib having a second refractive index,  $n_2$ , wherein  $n_2$  is greater than  $n_1$ ; and

e) forming a third layer of a third composition having a third refractive index,  $n_3$ , wherein  $n_3$  is lower than  $n_2$ .

21. A method of preparing a waveguide device, the method comprising:

a) coating a layer of a composition of at least one (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule, at least one non-fluorinated (meth)acrylate which is soluble in said fluorinated (meth)acrylate and has at least two (meth)acrylate groups per molecule, and at least one photoinitiator soluble in the fluorinated (meth)acrylate on a substrate;

b) exposing the coating to an actinic radiation to form a bottom cladding layer having a first refractive index,  $n_1$ ;

c) coating a layer of a second composition of at least one (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule, at least one non-fluorinated (meth)acrylate which is soluble in said fluorinated (meth)acrylate and has at least

two (meth)acrylate groups per molecule, and at least one photoinitiator soluble in the fluorinated (meth)acrylate on top of the bottom cladding layer;

d) patternwise exposing the coating of the second composition to an actinic radiation through a photomask having a desired feature to form a latent image in a core layer;

f) removing the non-exposed parts with an organic solvent to form a waveguide rib having a second refractive index,  $n_2$ , wherein  $n_2$  is greater than  $n_1$ ; and

g) coating a layer of a third composition of at least one (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule, at least one non-fluorinated (meth)acrylate which is soluble in said fluorinated (meth)acrylate and has at least two (meth)acrylate groups per molecule, and at least one photoinitiator soluble in the fluorinated (meth)acrylate on top of the core layer and the bottom cladding layer and exposing the third layer to an actinic radiation to form a top cladding layer with a third refractive index,  $n_3$ , wherein  $n_3$  is lower than  $n_2$ .

22. A method for preparing a waveguide device, the method comprising:

a) coating a layer of a composition comprising at least one (meth)acrylate prepared from a fluorinated monomer or polymer having at least two hydroxyl groups per molecule, at least one non-fluorinated (meth)acrylate which is soluble in said fluorinated (meth)acrylate and has at least two (meth)acrylate groups per molecule, and at least one photoinitiator soluble in the fluorinated (meth)acrylate on a substrate;

b) exposing the coating to an actinic radiation to form a solid layer; and

c) patternwise etching the solid layer with reactive ion etching (RIE).